

1. A system for collecting a subpopulation of cells from a digested organ or other biological material, comprising:
  - an apparatus having a first chamber adapted to receive an organ or other biological material to be digested in order to release a subpopulation of cells, and a second chamber operatively connected to said first chamber, said second chamber adapted to receive said subpopulation of cells; and
  - a material that mimics at least one physical, biological, and/or chemical characteristic of cells present in said subpopulation of cells.
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2. The system of claim 1 wherein said material includes a bead and zinc ions attached to said bead.
3. The system of claim 2 wherein said zinc ions are bound to said bead by a chelating agent.
4. The system of claim 3 wherein said chelating agent is selected from the group consisting of EDTA, DTPA, and ADA.
5. The system of claim 2 further comprising a tether linking said chelating agent to said bead.

6. The system of claim 1, further including a third chamber operatively connected to said first chamber, said third chamber adapted to receive a fluid flow from said first chamber.
7. The system of claim 6, further including a fourth chamber operatively connected to said first chamber, said fourth chamber adapted to receive a portion of said subpopulation of cells.
8. The system of claim 7, wherein said first, second, third, and fourth chambers are operatively connected one to another via a plurality of conduits.
9. The system of claim 8, wherein said first chamber, said third chamber, and said fourth chamber create a recirculation loop system, which allows for fluid flow through said chambers and said conduits.
10. The system of claim 9, wherein said recirculation loop system further includes a heat exchanger, and a pump, said heat exchanger and said pump operatively connected to said first, second, third, and fourth chambers via said plurality of conduits.

11. The system of claim 10, further comprising a plurality of valves adapted to be opened or closed, each of said plurality of valves operatively connected to one of said plurality of conduits.

12. In combination, an apparatus for collecting a subpopulation of cells from a digested organ or other biological material, said apparatus comprising a first chamber adapted to receive an organ or other biological material to be digested in order to release a subpopulation of cells, and a second chamber operatively connected to said first chamber, said second chamber adapted to receive said subpopulation of cells; and

5 a computer operatively connected to said apparatus to provide for operative control of at least one parameter of an environment within said apparatus, in order to facilitate said process of collecting a subpopulation of cells from a digested organ or other biological material.

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13. The combination of claim 12, wherein said at least one parameter is selected from the group consisting of temperature, pressure, pH, and dissolved oxygen concentration.

14. The combination of claim 13, said apparatus further including a third chamber operatively connected to said first chamber, said third chamber adapted to receive a fluid flow from said first chamber.

15. The combination of claim 14, said apparatus further including a fourth chamber operatively connected to said first chamber, said fourth chamber adapted to receive a portion of said subpopulation of cells.

16. The combination of claim 15, wherein said first, second, third, and fourth chambers are operatively connected one to another via a plurality of conduits.
17. The combination of claim 16, wherein said first chamber, said third chamber, and said fourth chamber create a recirculation loop, which allows for fluid flow through said first, third, and fourth chambers and said plurality of conduits.
18. The combination of claim 17, wherein said recirculation loop further includes a heat exchanger, and a pump, said heat exchanger and said pump operatively connected to said first, second, third, and fourth chambers via said plurality of conduits.
19. The combination of claim 18, further comprising a plurality of valves adapted to be opened or closed, each of said plurality of valves operatively connected to one of said plurality of conduits.
20. The combination of claim 19, said computer adapted to control the opening and closing of each of said plurality of valves.
21. The combination of claim 20, wherein the opening and closing of each of said plurality of valves is controlled by manual manipulation of said computer.

22. The combination of claim 21, wherein said computer further comprises a graphical user interface to facilitate manual manipulation of said computer.
23. The combination of claim 22, said computer operatively connected to a digital recording device adapted to record a first digital image of said subpopulation of cells.
24. The combination of claim 23, said computer being adapted to compare said first digital image to a second digital image.
25. The combination of claim 24, wherein said computer includes memory and said second digital image is archived in the memory of said computer.
26. The combination of claim 24, further comprising a material that mimics at least one physical, biological, and/or chemical characteristic of cells present in said subpopulation of cells.
27. The combination of claim 26, wherein said material includes a bead and zinc ions attached to said bead.

28. The combination of claim 27, wherein said zinc ions are bound to said bead by a chelating agent.
29. The combination of claim 28 wherein said chelating agent is selected from the group consisting of EDTA, DTPA, and ADA.
30. The combination of claim 26 further comprising a tether linking said chelating agent to said bead.

31. A material for optimizing a process for isolating a subpopulation of cells comprising

a bead,

zinc ions attached to said bead, and

a chelating agent covalently linked to said bead.

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32. The composition of claim 31, wherein said chelating agent is selected from the group consisting of EDTA, DTPA, and ADA.

33. The composition of claim 31, wherein said chelating agent binds said zinc ion to said bead.

34. The composition of claim 31, further comprising a tether linking said chelating agent to said bead.

35. A method for optimizing a process of isolating a subpopulation of cells comprising:
  - digesting an organ or other biological material in a medium within a recirculation loop, to form a subpopulation of cells;
  - 5 maintaining a fluid flow of said medium through said recirculation loop of said apparatus;
  - providing mock cells that mimic at least one physical, biological, and/or chemical characteristic of cells present in said subpopulation of cells; and
- 10 periodically removing cells from said subpopulation of cells from said recirculation loop and comparing said cells to said mock cells.

  

36. The method of claim 35 wherein said mock cells comprise a bead and zinc ions attached to said bead.
37. The method of claim 36 wherein said zinc ions are bound to said bead by a chelating agent.
38. The method of claim 37 wherein said chelating agent is selected from the group consisting of EDTA, DTPA, and ADA.
39. The method of claim 36 further comprising a tether linking said chelating agent to said bead.

40. The method of claim 35, wherein said comparison is performed manually.
41. The method of claim 35 further comprising controlling said process of collecting a subpopulation of cells from a digested organ or other biological material with a computer.
42. The method of claim 41 wherein comparing said cells to said mock cells is performed by said computer.
43. The method of claim 42, further comprising recording a first digital image of said subpopulation of cells with a digital recording device operatively connected to said computer.
44. The method of claim 43, further comprising comparing said first digital image to a second digital image wherein said second digital image is an image of said material in said fourth chamber with said subpopulation of cells.

45. A method for optimizing a process of isolating a subpopulation of cells comprising:
  - digesting an organ or other biological material in a medium within a recirculation loop to form a subpopulation of cells;
  - 5 maintaining a fluid flow of said medium through said recirculation loop;
  - providing a computer operatively connected to said recirculation loop for operatively controlling at least one parameter of the isolation of said subpopulation of cells; and
  - 10 periodically removing cells from said subpopulation of cells and comparing the cells to a standard to determine the extent of digestion.
46. The method of claim 45, wherein said at least one parameter is selected from the group consisting of temperature, pressure, pH, and dissolved oxygen concentration.
47. The method of claim 46, wherein said comparison is performed manually.
48. The method of claim 46 further comprising controlling said process of collecting a subpopulation of cells from a digested organ or other biological material with a computer.

49. The method of claim 46 wherein comparing said cells to said standard is performed by said computer.
50. The method of claim 49, further comprising recording a first digital image of said subpopulation of cells with a digital recording device operatively connected to said computer.
51. The method of claim 50, further comprising comparing said first digital image to a second digital image, wherein said computer includes memory and said second digital image is archived in the memory of said computer.

52. A cell digestion comprising:

- a digestion chamber;
- a measuring cylinder;
- a pump;
- 5 a heat exchanger; and
- a sampling chamber;

wherein said digestion chamber, said measuring cylinder, said pump and said heat exchanger are operatively connected one to another to form a recirculation loop for fluid flow of partially digested material

10 therethrough, and wherein said sampling chamber is adapted to periodically remove partially digested material from said recirculation loop.

53. The cell digestion of claim 52 further comprising a computer operatively connected to said recirculation loop to provide control of said process of collecting a subpopulation of cells from said partially digested material.

54. The cell digestion of claim 53, said computer operatively connected to a digital recording device adapted to record a first digital image of said subpopulation of cells.

55. The cell digestion of claim 54, said computer adapted to compare said first digital image to a second digital image.

56. The cell digestion of claim 55 wherein said computer includes memory and said second digital image is archived in the memory of said computer.
57. The cell digestion of claim 55 wherein said second digital image is an image of mock cells in said sampling chamber with said subpopulation of cells.
58. The cell digestion of claim 57 wherein said mock cells comprise a bead and zinc ions attached to said bead.
59. The cell digestion of claim 58 wherein said zinc ions are bound to said bead by a chelating agent.
60. The cell digestion of claim 59 wherein said chelating agent is selected from the group consisting of EDTA, DTPA, and ADA.
61. The cell digestion of claim 58 further comprising a tether linking said chelating agent to said bead.